

ACMA5002 Coursework Feedback

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Selected topic/product/project: Injection-Moulded PC/ABS Mobile Phone Case

Final mark: 70/100

1. Engagement with Literature Skills — 11/15

The report uses a broad range of relevant sources covering DFM, DFA, injection moulding, QFD, FMEA, DOE, polymer materials, sustainability and manufacturing economics. Recognised texts by Ashby, Boothroyd, Groover, Kalpakjian, Montgomery and Rosato are used to support principles such as uniform wall thickness, draft, material selection, tolerances and process optimisation. Literature is generally linked to the selected phone-case application and is used to explain the anticipated causes and mitigation of moulding defects. The reference list is substantial, although several references are duplicated, some entries are incomplete, and the standard of source presentation is inconsistent. More critical comparison between sources and stronger traceability for material-price and processing assumptions would raise the mark.

2. Knowledge and Understanding Skills — 22/30

The submission demonstrates good understanding of DFM, DFA, injection moulding, common moulding defects, material selection and high-volume manufacturing. Relevant principles are applied through a single-piece case, uniform walls, rounded geometry, functional openings and consideration of tolerances, cooling, ejection and gate placement. The material discussion compares ABS and polycarbonate properties and develops a PC/ABS blend as a compromise between strength, hardness, impact performance, cost and processability. The report also demonstrates sound understanding of recyclability, energy use, waste reduction and production economics. Greater technical precision is needed because the final 60/40 PC/ABS blend is not directly validated through a specific Granta material record, and the report does not provide a clearly defined step-by-step manufacturing and inspection plan.

3. Cognitive and Intellectual Skills — 19/30

The QFD converts customer needs into weighted technical priorities and identifies dimensions, tolerances, hardness, tensile strength and impact resistance as important requirements. The FMEA evaluates credible product risks including poor fit, cracking, grip, scratching, weight, heat resistance and recyclability. A structured Taguchi L9 DOE is designed using melt temperature, injection pressure and cooling time, with appropriate responses and an intended analysis procedure involving signal-to-noise ratios and ANOVA. This demonstrates good understanding of optimisation methodology. However, the nine experiments are proposed rather than completed, so no measured simulation results, statistical analysis or optimum factor combination are presented. The plastics outputs identify fill confidence, sink marks, weld lines and warpage, but these findings are not quantified or used to demonstrate a completed design revision.

4. Practical Application Skills — 11/15

The report provides good evidence of Fusion 360 CAD work, including several component views, a technical drawing and additional top and bottom mould representations. The phone-case geometry contains the main functional openings and is developed as a simple single-piece component. Granta screenshots support the comparison of cost, yield strength, hardness and candidate material properties. Fusion plastics results demonstrate complete filling and identify areas susceptible to sink marks, weld lines and warpage. The practical evidence is therefore substantial and relevant. The main limitation is that no completed FEA results are included, although FEA is identified as part of the intended methodology. Numerical moulding results,

simulation settings, dimensional tolerances and evidence of a revised and re-simulated design would also strengthen the practical validation.

5. Transferable Skills for Life and Professional Practice — 7/10

The report is comprehensive and follows a clear progression from literature and customer requirements through analytical tools, design, simulation, cost and sustainability. It includes a contents page, numbered sections, tables, CAD images, simulation screenshots, calculations, a conclusion and a substantial reference list. The cost analysis is clearly communicated and distinguishes material, machine, labour and tooling costs before calculating a break-even quantity of approximately 34,000 units. Figures generally support the surrounding discussion and the conclusion summarises the major project outcomes. The professional standard is reduced by frequent grammatical errors, inconsistent referencing and figure formatting, limited cross-referencing, and several claims that are stronger than the completed evidence, particularly concerning optimisation and structural validation.

Mark summary

Assessment category	Maximum mark	Mark awarded
Engagement with Literature Skills	15	11
Knowledge and Understanding Skills	30	22
Cognitive and Intellectual Skills	30	19
Practical Application Skills	15	11
Transferable Skills for Life and Professional Practice	10	7
Total	100	70